

Fig. 1.

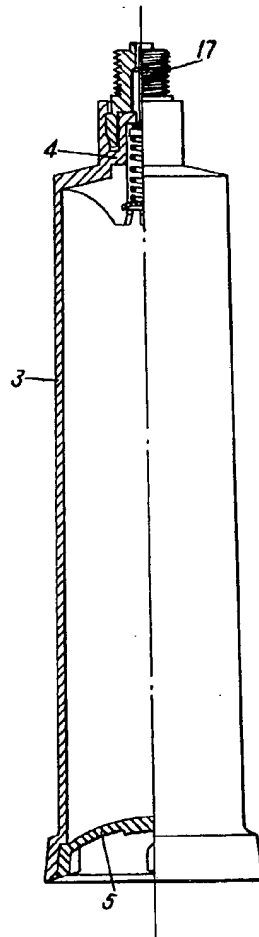
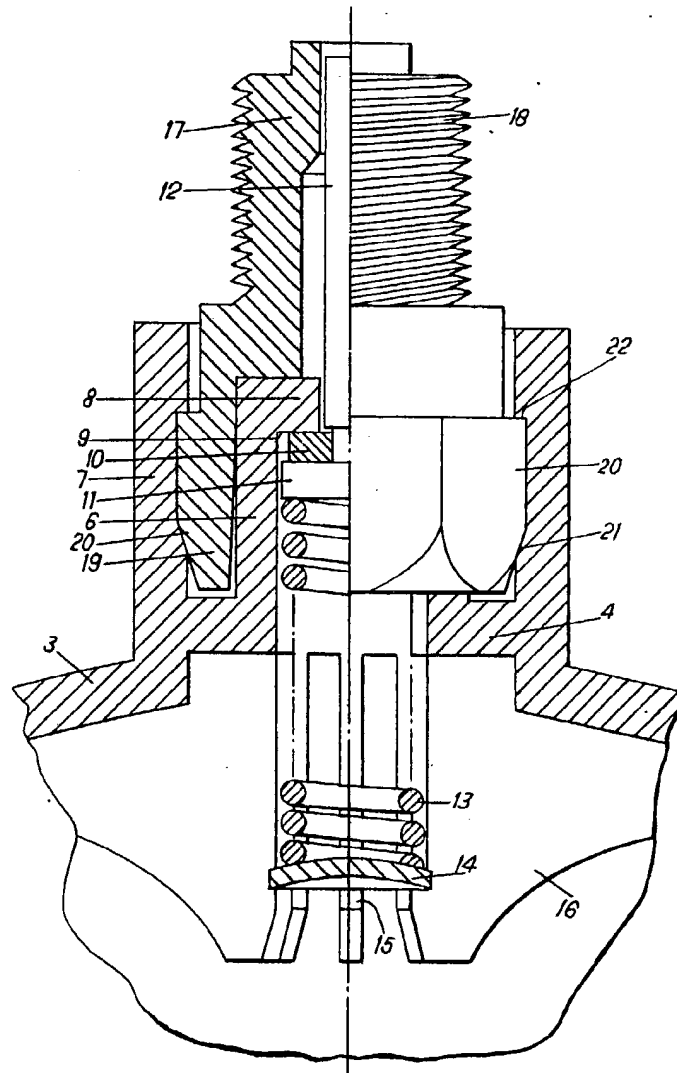


Fig. 2



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(54) LIQUEFIED GAS FUEL CARTRIDGE

(71) We, COLIBRI LIGHTERS LIMITED, a British Company, of Colibri House, 68/71, Warren Street, London, W1P 6AD, do hereby declare the invention, for which we pray a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention is concerned with that kind of disposable multi-charge refill liquefied gas fuel cartridge for gas burning cigarette lighters which has a body made of a comparatively soft plastics material and, at one end, a neck incorporating a valve mechanism and a discharge nozzle for application to the inlet of the fuel reservoir tank of a cigarette lighter. The valve mechanism comprises a closure member which is urged by a spring in the axial direction outwardly of the nozzle to trap a sealing ring between the closure member and a sealing surface. The valve is opened, when the nozzle is applied to a cigarette lighter, by an axial reaction into the nozzle which causes the closure member to move against the action of a spring. This construction is hereinafter referred to as of the kind described.

In previous refill cartridges of this kind, the sealing surface and the nozzle have been formed as integral parts of a tubular valve body which is received within a recess at the neck end of the cartridge body. The nozzle is made of metal or a plastics material harder than that from which the cartridge body is made, in order that a good screw threaded or other engagement may be provided over a number of successive refill operations with the inlet of the cigarette lighter fuel tank. It follows that the whole of the valve body must be made of this material which is considerably more expensive than that from which the cartridge body is made. A further disadvantage is that there is always the danger that some of the liquefied gaseous fuel under pressure within the cartridge will leak out to atmosphere around the outside of the valve body, thus by-passing the main valve mechanism within the valve body.

[Price 33p]

In accordance with the present invention the body of a refill cartridge, of the kind described, has a neck portion which provides both the sealing surface and an axially open annular groove that receives and locates an annular skirt of a tubular nozzle, which is preferably made of a harder material than that from which the neck portion is made.

With this arrangement the valve sealing ring seals directly against a sealing surface formed integrally with the neck portion and there is no danger of by-pass leakage. Also, only the nozzle need be made of the harder more expensive material and cost is thus reduced.

A further advantage is that the nozzle may be applied to the cartridge as a final assembly step after the cartridge has been filled and whilst it is sealed. This gives the manufacturer or wholesaler the opportunity to keep in stock filled cartridges to which appropriate nozzles, for cooperation with the inlets of particular cigarette lighter fuel tanks, can be applied only after the requirements of his customers are known.

The annular groove in the neck portion is preferably provided between two coaxial tubular parts of the neck portion, the inner part having at its free end a radially inwardly projecting flange providing a shoulder which forms the sealing surface, and the outer part receiving outward projections of the skirt to locate the nozzle on the neck portion. It is preferred that the engagement between the nozzle skirt and neck portion be in this manner so that any flexure of the neck portion necessary to locate the nozzle is received as a radial outward reaction, rather than a radial inward reaction, which might distort the sealing surface and the security of the valve.

Preferably the neck portion is integral with the cartridge body which has a bottom closure that is fitted after fitting of the valve mechanism in position and filling of the cartridge.

An example of a refill cartridge constructed in accordance with the present invention is

illustrated in the accompanying drawings, in which:—

Figure 1 is a side elevation partly in section; and,

5 Figure 2 is an enlargement, partly in section, and partly broken away, of the nozzle end of the cartridge.

The cartridge comprises a body 3 which is moulded from nylon integrally with a neck portion 4. The bottom of the body is closed by a closure 5. The neck portion 4 is formed with inner and outer tubular parts 6 and 7. The inner part 6 has a flange 8 the under shoulder of which forms a sealing surface 9 for a sealing ring 10 which is carried by a metallic closure member 11 preferably formed integrally with a stem 12. The closure member 11 is urged upwards to close the valve and trap the sealing ring 10 against the shoulder 9, by means of a helically coiled compression spring 13 which takes its reaction from a disc 14 force fitted into radial profiled webs 16 moulded integrally with the body 3. The valve mechanism is inserted through the bottom of the body 3 before the cartridge is filled with liquefied fuel gas under pressure and the closure 5 is applied.

A tubular discharge nozzle portion 17 formed with screw threads 18 for cooperation with the inlet socket of a fuel tank of a cigarette lighter, and made of a harder material, such as brass, glass-filled nylon, or glass-filled acetal, is located in position by means of a skirt 19 which is forced into the annular groove between the parts 6 and 7. Axial fin-like protrusions 20 which project outwards from the skirt 19 have tapered leading edges 21 which enable the skirt to be forced into the groove, with some outward flexure of the part 7, and angular shoulders 22 which bite in and then prevent subsequent withdrawal of the nozzle portion 17 again. It will be appreciated that the nozzle portion 17 may be applied as a final assembly step

after the cartridge has been sealed and filled. 45

In conventional manner, when the cartridge is used to refill the fuel tank of a cigarette lighter, the stem 12 is forced inwardly in the nozzle and forces the closure member 11 axially against the action of the spring 13 so that fuel can flow around the closure member 11 and through the nozzle end of the lighter. 50

WHAT WE CLAIM IS:— 55

1. A refill cartridge of the kind described, which has a neck portion which provides both the sealing surface and an axially open annular groove that receives and locates an annular skirt of a tubular discharge nozzle. 60

2. A refill cartridge according to claim 1, in which the tubular nozzle is made of a harder material than that from which the neck portion is made.

3. A refill cartridge according to claim 1 or claim 2, in which the annular groove is between two coaxial tubular parts of the neck portion, the inner part having at its free end a radially inwardly projecting flange providing a shoulder which forms the sealing surface, and the outer part receiving outward projections of the skirt to locate the nozzle on the neck portion. 65

4. A refill cartridge according to any one of claims 1, 2 or 3, in which the neck portion is integral with the cartridge body which has a bottom closure that is fitted after fitting of the valve mechanism in position and after filling of the cartridge. 75

5. A refill cartridge according to claim 1, substantially as described with reference to the accompanying drawings. 80

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